

CLAIMS

1. Analog signal repeater system (1) where frequency converting repeaters (6-9, 10-13) of any of super-heterodyne and super-regenerative type realised with 5 any of analogue and digital signal processing and realised with any of discrete semiconductors, MMIC semiconductors and ASIC semiconductors are applied to optimize signal dynamics by avoiding echo between repeaters (6-9, 10-13) and where each information channel (15, 16) repeater is of duplex type, characterised by the repeater system (7, 9, 12, 10) includes at least 10 one cascade (2, 14) which is satisfied using not more than two frequency bands for each information channel for repeating the signals while maintaining isolation against interference between repeaters and against reflections and signal echo.
2. Analog signal repeater system according to claim 1, 15 characterised by frequency converting repeaters (38) of super-heterodyne or super-regenerative type being arranged with an intermediate frequency (33) which is suitable for interconnection with an adapter (36) for adaption of signal frequencies (37) and levels toward a commercially available data network node (36) of suitable type as with nodes for wireless networks based 20 on IEEE802.11x.
3. Analog signal repeater system according to claim 1 characterised by (40) an adapter (41) performing frequency conversion of a high frequency signal (53) or microwave signal (53) to and from a network 25 node (42), corresponding to a modem (42) or correspondingly a PC adapter (42) for network communication and as an example a PC adapter (42) for wireless network using IEEE802.11x protocol by the adapter's (41) resultant frequency (45) being correspondingly (45) adaptable analog repeater (38) which may be connected at any point (51) in an analog cascade (52). 30
4. Analog signal repeater system according to claim 1, characterised by an adapter solution (61) correspondingly (41) where in addition to a frequency conversion arrangement (64) a bypass signal path is arranged (63, 65 69), with or without frequency conversion, for return signal (63)

with, if necessary a stop filter (69) for the available frequency region in the forward direction (62) to achieve acceptable duplex conditions and where the application may be cable modems (73) or other.

5 5. Analog signal repeater system where a combination method (70) achieves isolation between input signal and output signal (73-76) for a repeater (70) with antennas (71, 72) as well as avoids reflections back to the repeater (70) characterized by the application of two frequency bands using two repeaters (82, 83) that repeat within same frequency band (74-76, 73-75) but
10 10. where two bi-directional, advantageously one-port repeaters (82, 83) contain differing frequency bands for the two signal directions (74-76, 73-75) to achieve isolation against interference between repeaters and against reflections and signal echo and where the isolation is further increased by additionally facilitating the use of separate amplifiers for input and output signals (77-80, 78, 79) as well as
15 15. opposite antenna polarisation or coupler polarity for the differing signal ports (73-74, 75-76).

6. 6. Analog signal repeater according to claim 5, characterized by the repeater arrangement to facilitate a built-in radio
20 20. interface (81) for interface communication which can be two-way.

7. 7. Analog signal repeater system arrangement with analog repeaters of one frequency kind or frequency converting kind for transmission of large bandwidths on free standing conductors according to the Lecher principle on any metallic conductor without insulation layer, with thin insulation layer or with insulation layer of loss angle and suitable for short wavelengths all the way up to very short wavelengths in the millimetre regions and where the wave propagation exhibit very low attenuation
25 25. characterized by the repeater arrangement (190, 210, 230) to apply antenna like couplers in connection with one free standing conductor and which does not require galvanic coupling and where the couplers radiate in opposite directions out from the repeaters.

8. Analog signal repeater (140, 150, 160) where a combination method (150, 160, 170) achieves isolation between galvanically coupled or direct coupled input and output signal ports (161, 162) for an analog repeater (70) of the one frequency kind or of the frequency converting kind as well as achieves dampening of
5 reflections, signal interference and signal echo between repeaters,
characterised by the application of toroids of magnetic or dielectric kind (140) between cable terminations 161, 162, 163 whereby these can utilise an implicit impedance (189) or a combination of implicit and added impedance (189) to yield increased isolation between the repeater ports 161, 162, 163, as well as
10 171, 172 as well as cable terminations 165, 166 including 178, 179.
9. Analog repeater system (250, 260, 310, 330, 360, 390) where a combination method (250, 260, 310) achieves isolation between none galvanic coupled or none direct coupled input and output ports (312-313, 331, 372-373,
15 372-380, 373-380) for an analog repeater (70) of one frequency kind or of frequency converting kind as well as achieving dampening of reflections, signal interference and signal echo between repeaters,
characterised by the application of inductive coupler loop for none galvanic or none direct coupling that also can have increased efficiency with
20 toroids of magnetic or dielectric type (140) encircling both cable conductors and coupling loop and which is installed between cable terminations 161, 162, 163 and which thereby can utilise an implicit impedance (189) or a combination of implicit and added impedance (189) to yield increased isolation between the ports (312-313, 331, 372-373, 372-380, 373-380) as well as between cable terminations 165,
25 166 including 178, 179 including 311, 319, including 331, 332, including 361, 362 including 361, 280 including 362, 380.
10. Analog signal repeater according to claim 9,
characterised by the application of a combination of none galvanic or
30 none direct coupling and galvanic or direct coupling.

SUMMARY

The present invention concerns analog signal repeater system solutions of the general kind. It concerns in particular stability with analog signal repeater systems.